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APPLE II TENTH ANNIVERSARY, PART II

The #1 Apple II Magazine

Should You Get
Apple's Upgrade Kit
or Is There a Better Way?

THE IIGS UPGRADE

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UPGRADING TO THE IIGS

How current Apple II-series owners can step up to the power of the IIGS

Moving up to the IIGS is a logical next step for owners of current Apple-II-series computers: You get a souped-up, Macintosh-like computer that still works with most of your current software and peripherals. If you own an Apple IIe, it's pretty obvious how you can upgrade to a IIGS—by purchasing an upgrade kit from Apple that gives your old IIe new innards. But that's only one approach to upgrading. Even if you have a IIc or a II Plus, there is still an upgrade path for you. You can sell (or set aside) your old CPU, buy a IIGS system unit, and use it with your old software and peripherals.

Here we examine the whys and wherefores of purchasing the official Apple upgrade kit and describe what you can and can't take along with you no matter which upgrade path you take and no matter which Apple II you're starting with.

The Apple IIGS upgrade kit, scheduled for release later this year, will give the almost two million IIe users the opportunity to transform their computers into IIGS equivalents for only \$499. The upgrade is not available to II, II Plus, or IIc owners, however, despite frequent rumors to the contrary. It simply won't work with these computers because of lack of space inside the computer (IIc) or incompatible keyboards (II and II Plus).

The upgrade is only half the price of a real IIGS (the IIGS system unit, keyboard, and mouse cost \$999). And, if you purchased a IIe from an authorized Apple dealer between July 15 and September 14, 1986, you can get a \$100 rebate for an upgrade.

But is it really a good buy? Will you still be able to use all your old peripheral cards and software? Should you keep your IIe and ignore the IIGS? Or is this the time to sell your IIe, II Plus, or IIc system unit and graduate to a genuine IIGS? These are some of the questions I hope you'll be able to answer after reading this article.

Details of the Upgrade

The IIGS upgrade kit consists of three items: a IIGS motherboard, a metal base pan, and a manual that describes the differences between a IIGS and a IIe. The upgrade does not include a IIGS keyboard, power supply, or case—you must salvage these items from your IIe. The upgrade also does not include the IIGS mouse or a disk drive.

The kit's motherboard is identical to the IIGS motherboard except that it has two additional connectors: one for the IIe keyboard and one for the optional IIe keypad. A new base pan (which includes the back panel) is needed because the IIe base pan does not have openings for the IIGS's built-in port connectors.

According to Apple, the upgrade kit must be installed by an authorized Apple dealer, but the \$499 price does not include installation charges. Installation doesn't take long, however, so these charges should be low—some dealers may even do it free. Unfortunately, you are not allowed to keep your IIe motherboard; dealers must ship these back to Apple.

Installation is relatively simple and involves the following steps:

- disconnect the power supply, key-

board, and speaker cables from the IIe motherboard

- remove the base pan from the plastic casing of the IIe and save the speaker
- insert the IIGS motherboard and the new base pan
- reconnect the power supply, keyboard, and speaker cables.

The computer you end up with is functionally no different from a real IIGS—it just has a different keyboard and a different case. Thus, you will be able to take advantage of all the IIGS-specific software that will begin to appear in 1987, notably graphics and sound applications. One caveat: Most of this new software will probably require a mouse and 3.5-inch disk drives, but these are not part of the upgrade kit. You might need to budget a few hundred dollars more for these items.

Hardware Compatibility

A major factor in deciding whether to buy the IIGS upgrade is whether you can protect your existing investment in peripheral hardware. In other words, will all those nifty interface cards you've grown to know and love still work on the Apple IIGS?

Keep in mind that the IIGS has several built-in I/O ports, so you won't even need some of your old cards in the first place. That's nice because you can conceivably recoup part of the upgrade price by selling your redundant peripherals to II Plus users or to IIe users who aren't upgrading.

Built into the IIGS are two serial interfaces, a mouse interface, analog RGB and composite video ports, and a SmartPort controller for 3.5-inch

and 5¼-inch disk drives. The GS also has an internal battery-operated clock, a music/speech synthesizer, and 80-column-display circuitry. It seems pointless, therefore, to use cards that simply duplicate these functions.

You may want to continue using an interface card instead of the corresponding port, however, if the firmware on the card lets you issue useful commands that the IIGS does not. For example, some printer-interface cards, such as the Serial Grappler and Alphabits, contain advanced screen-printing utilities. And most clock cards give you the time and date in a variety of formats if you use a few simple Applesoft commands, unlike the IIGS clock.

You may also want to use a card instead of a port to avoid the expense of (or the hassle of making) a new cable for a printer or modem you already use. It's quite astounding, but it seems that every time Apple releases a new computer, it dreams up a new I/O connector. The serial connectors on the IIGS are 8-pin circular connectors, not the ones used on the IIc or on any peripheral card I've seen for the IIe or II Plus. These connectors are used on the Macintosh Plus, however.

Most (but not all) Apple II peripheral cards that plug into an I/O slot (not the IIe auxiliary connector) can work on the IIGS. The cards that definitely cannot work are multi-function cards that use "phantom" slot techniques (where an I/O de-



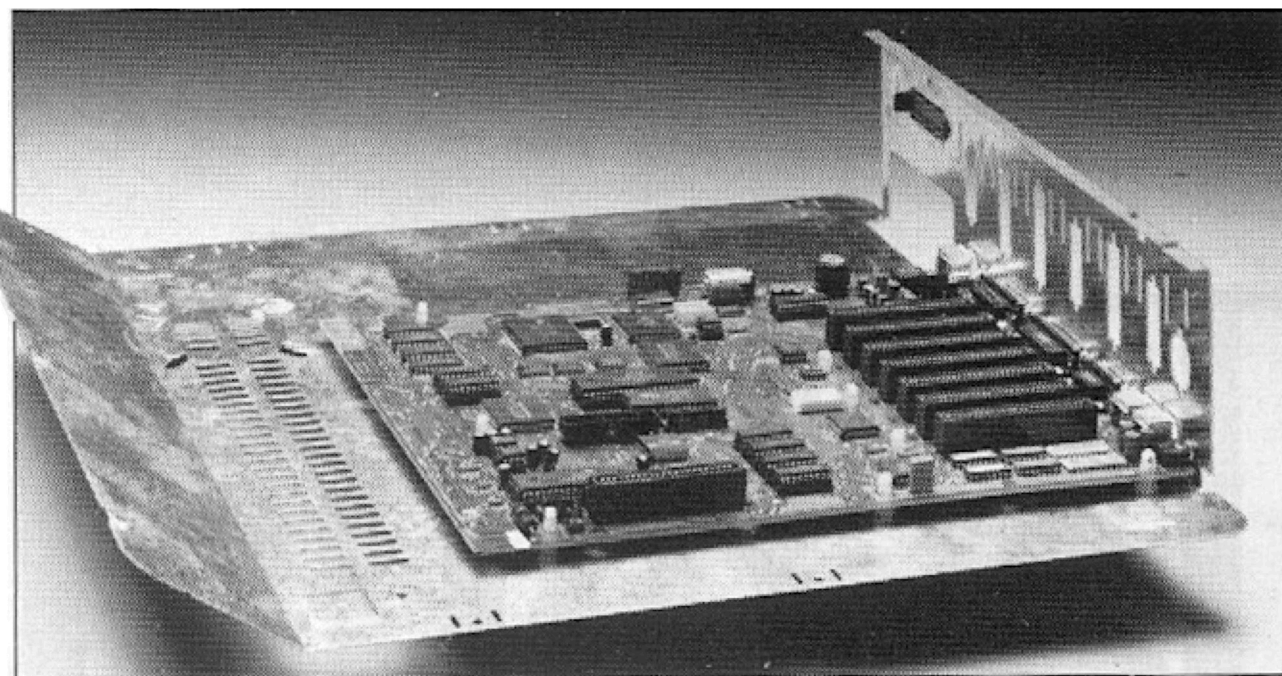
vice appears to be in a slot different from the slot in which the card is inserted), such as the Street Business-Card, AST Multi-I/O, and the Prometheus Versacard. These types of cards simply can't cope with the 16-megabyte address range of the 65816 microprocessor of the IIGS. Multifunction cards that don't use phantom slots, notably the RC Systems Slotbuster, can work.

Generally speaking, single-function cards work fine on the IIGS—the list includes serial and parallel printer-interface cards, internal-modem cards, disk-drive controllers, and memory cards compatible with the Apple II Memory Expansion Card (such as the Applied Engineering RamFactor and the AST Sprint-Disk). There are exceptions, so you should ask the manufacturer of any given card whether it will work, before you upgrade.

Apple recommends using a fan if you install more than two expansion cards in the IIGS, to avoid heat-related damage to components. Apple sells an internal IIGS System Fan, but it won't fit inside an upgraded IIe case—use something such as the Kensington System Saver instead.

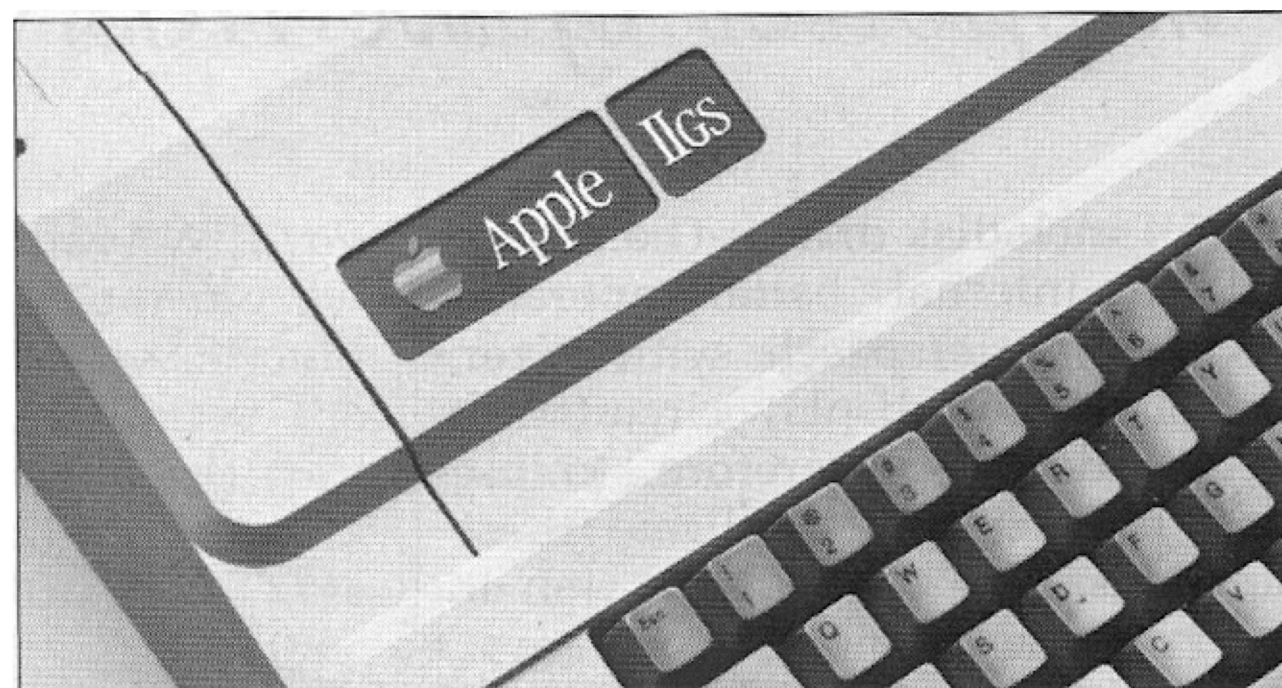
Two important exceptions relate to drive controllers. The interface card for the Apple ProFile hard-disk drive doesn't work properly on the IIGS—in fact, if you tried to use it, you could lose data. Apple has published a simple hardware fix to solve this problem, however. Older versions of Central Point Software's Universal Disk Controller won't

INSIDE:
The \$499 Apple IIe-to-IIGS upgrade kit includes a metal base pan that has the new back panel and a IIGS motherboard. The kit's motherboard is identical to the IIGS motherboard except that the kit has the connectors for the IIe keyboard and IIe keypad.



WHAT THE UPGRADE GIVES YOU

OUTSIDE:
You will get an Apple IIGS logo to stick on your IIe, and a manual that describes the differences between a IIGS and a IIe.



work either, but, again, Central Point will make you a simple fix for a small charge. Eight-bit accelerator cards don't work on the IIGS at all, which causes no problems, because the IIGS already operates up to 2.8 times faster than does a standard IIe. (Note: Applied Engineering is working on a 16-bit accelerator designed to increase the speed of the IIGS.)

Any card designed for the auxiliary connector on the IIe definitely cannot work on the IIGS, because the

IIGS has no auxiliary connector. So you can say good-bye to 80-column/memory cards such as MultiRAM and RamWorks. Many people also buy RGB video adapters for these cards that drive digital RGB color monitors. Unfortunately, the IIGS generates analog RGB signals, so you can't connect a digital monitor to the RGB port of the IIGS. (See "The IIGS Shows Its Colors," in this issue.) So say goodbye to your digital RGB monitor, too.

BUT HOW MUCH WILL IT REALLY COST YOU? FOUR SCENARIOS

No matter which old Apple you own, there's a way to carry over some of your previous investment (in terms of peripherals and software) to a IIGS. If you own a IIe, you can upgrade by swapping out the motherboard. Or, with the II Plus, IIe, or IIc, you can set aside or sell your old system and plug in a new IIGS box in its place—amid your old disk drives, modems, printers, and such.

But, (and this is a formidable *but*), if you want to step up to the GS, chances are you'll also want to buy the peripherals that allow you to take advantage of the fanciest features of this system. To use GS-specif-

ic software, you'll need 3.5-inch disk drives, and to appreciate all those beautiful graphics, you'll probably want an analog RGB monitor. Here's a snapshot look at four sample situations—and their approximate costs—in which an Apple owner upgrades or sells an old system in order to move up to the GS.

SCENARIO #1

Approximate cost: \$500

John is an Apple IIe owner who takes the simplest route: He buys the upgrade kit from Apple and continues to use the printer, modem, 5¼-inch disk drives, software, and composite monitor he already has.

Software Compatibility

Apple has made a concerted effort to make the IIGS compatible with existing IIe software. As a result, almost all Apple IIe software works with it without modification, including such standards as AppleWorks, Apple Writer, MouseWrite, The Print Shop, and Pinpoint.

A few programs cannot work on the IIGS at all, however. The biggest culprits are communications programs that bypass the serial-port firmware and communicate directly with the port's hardware registers. Many such programs understand only the 6551 chip of the Super Serial Card, but the IIGS uses the Intel 8530 chip. (This is the same chip the Macintosh uses; Apple used it to permit the IIGS to connect easily to AppleTalk networks.) Point-to-Point was designed to work with the IIGS. Others, such as ASCII Express and CommWorks, were upgraded after the announcement of the IIGS last September. Contact the publisher of your software for upgrading information if you have an old version.

Some software may work on the IIGS but only at normal speed (1 MHz). This category includes any software that relies on precise timing loops, primarily music software and some games. You can use the IIGS Control Panel desk accessory to switch from the fast speed (the IIGS default) to normal speed.

Programs that use the cassette port on the IIe won't work on the IIGS because the IIGS has no cassette port. Few users will lose sleep over

this restriction because programs that require such a port are rare.

Apple has distributed a software compatibility chart to dealers, but I wouldn't rely on it too much. It's just too difficult to keep accurate track of so many versions of so many programs. If you really want to be sure your program works, sit down in a dealer's showroom and try your software on a IIGS. You should also con-

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tact the software publisher to verify compatibility and inquire about special IIGS versions. All major publishers are taking prompt steps to make their programs work on the IIGS if they don't already.

For some users, an attractive alternative to buying the IIGS upgrade kit is to buy a real IIGS and keep the old Apple II or sell it. The extra cost for IIe owners is only \$500, but it's even less if you consider that you have to pay for the upgrade kit, installation, a mouse, and a numeric keypad to get the equivalent of a \$999 IIGS. And just think how happy the kids will be when you give them your spare computer or how happy you

will be if you can sell the old Apple for more than the cost of an upgrade kit! But remember, the longer you wait, the harder it will be to sell your old system, so move quickly. Just ask people still using the II Plus whether they wish they had moved up to the IIe four years ago.

If you take this route, the only extras you really need to have before firing up the IIGS are a video monitor and a disk drive (preferably a 3.5-inch drive). You can purchase composite black-and-white monitors for less than \$100 (or you can splurge and spend \$499 on Apple's RGB monitor); Apple's 3.5-inch disk drive will cost you \$399, but you can probably find other drives for less. External peripherals you might already have—such as modems and serial printers (for example, the ImageWriter)—work with both old Apple II-series computers and the IIGS. All you have to do is invest in another set of cables. If you have a parallel printer, you'll have to buy a parallel-interface card for the IIGS.

Decision Time

I'm convinced that if you own an 8-bit Apple II and you're not using a lot of oddball software or hardware that won't work on the IIGS, you should move up to a IIGS, either by purchasing the IIe upgrade or buying the IIGS itself. It's just too good a deal to turn down. +

Gary Little is the author of Point-to-Point, a communications program for the IIe, IIc, and IIGS published by Pinpoint Publishing.

However, if he later wants to use the more powerful GS software, he'll need to spend another \$500 or so to buy a 3.5-inch drive and a mouse.

SCENARIO #2

Approximate cost: \$650

David has an Apple IIe with 128K of memory, two 5¼-inch disk drives, a composite monitor, hard-disk drive, printer, multifunction card, and modem. For \$750, he sells the system with its additional memory, one of the drives with the controller card (he keeps one to run his old software on the GS), and the multifunction card (since it won't work on the new system). The rest of the peripherals

he keeps to use with the GS, and he also buys a 3.5-inch drive so that he can take advantage of the new software. The suggested price for the IIGS (which includes a mouse) plus disk drive is \$1398, so with the amount David receives for his old system, his net out-of-pocket expense is \$648.

SCENARIO #3

Approximate cost: \$900

Elizabeth owns an Apple IIc with a composite monitor, second disk drive, printer, and modem. She sells the system unit with its built-in drive for \$500 and keeps all her other peripherals to use with the GS. Be-

sides buying the IIGS system, she also buys a 3.5-inch drive, for \$1398. Subtracting the \$500 she gets from selling her IIc, her total outlay is \$898.

SCENARIO #4

Approximate cost: \$1150

Ron has an Apple II Plus with two 5¼-inch drives, printer, modem, monochrome monitor, hard-disk drive, accelerator board, and multifunction card. He sells the system unit, one drive, the monitor, and enhancement cards for \$750 and then buys a GS with 3.5-inch drive and RGB monitor for the suggested price of \$1897—his net cost is \$1147.

The Learning Curve

BY DAVID D. THORNBURG

IS THE IIGs UPGRADE A SCHOOL'S BEST BUY?

*It's a question of your
students' needs*

Last October I participated in an educational-computing conference in California that drew more than 2000 educators. Two questions cropped up frequently:

1. What did I think about the new Apple IIGs?
2. Should schools rush to upgrade their Apple IIe computers?

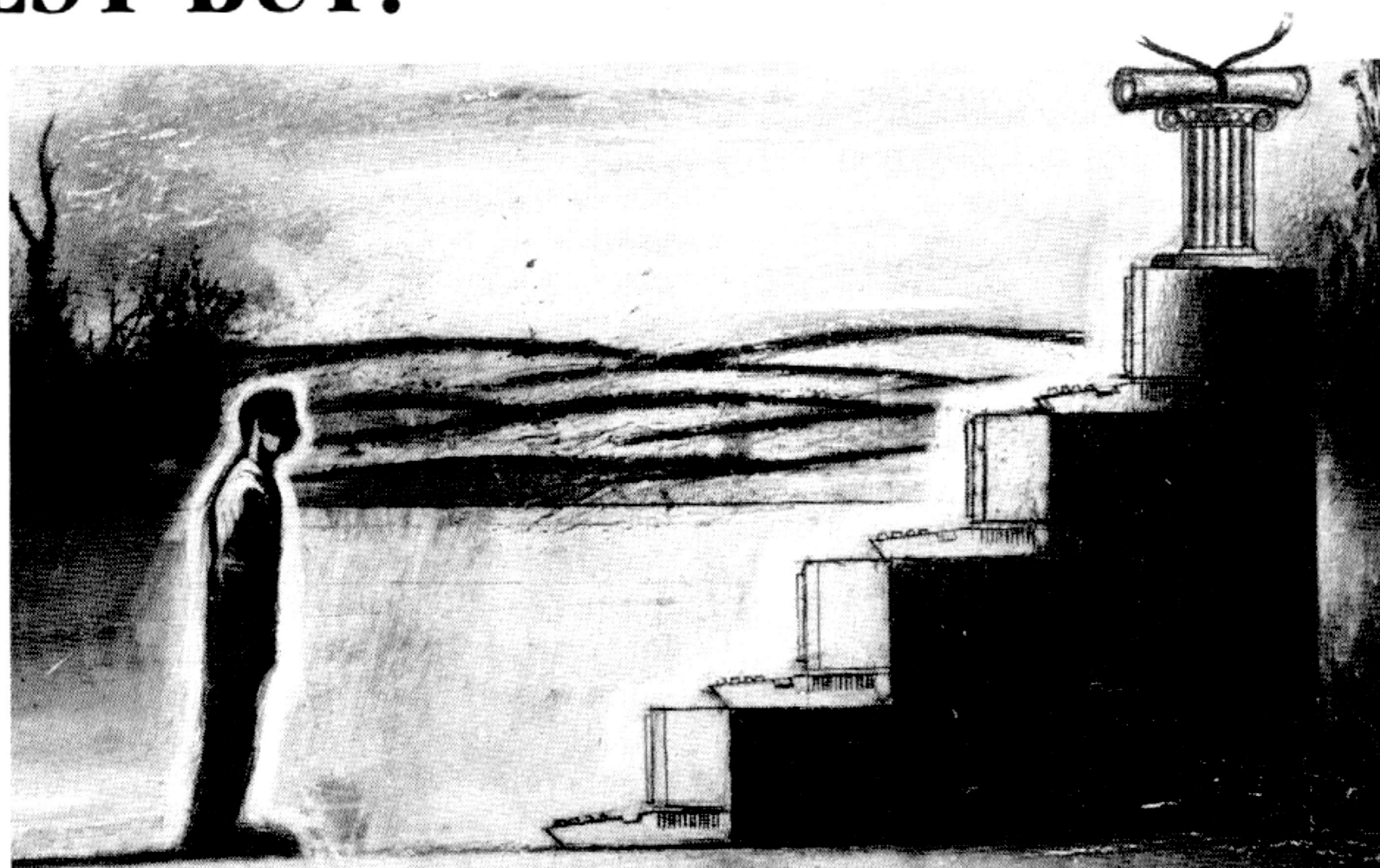
Easy One First

As someone who has long been critical of the original Apple II sound and graphics, I find the IIGs to be a refreshing sign that Apple is willing to provide people with the improvements they deserve.

The lowly Atari 400 (remember it?) ran circles around the old Apple II in the areas of sound and graphics, and the Commodore Amiga provides even richer capabilities in these areas. Quite frankly, some of us were beginning to wonder when Apple was going to wake up to the computers of the 80s.

By providing enhancements in graphics and sound while retaining compatibility with the massive installed base of Apple II programs, Apple seems to have achieved the best of both worlds, and the future of the Apple II line looks secure.

Of course, my personal interests influence my views. My office is littered with music synthesizers and graphics tools, and I spend much of my spare time tinkering with them. As a result, my enthusiasm for the Apple IIGs comes from the freedom this computer gives me to play in the domains that are of greatest interest to me.



What About Education?

As I look at the role of the Apple IIGs in education, I have a hard time separating my personal enthusiasm for this new machine from my perspectives on how computers are functioning in classrooms today and

*The challenges facing
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how they may serve in the future.

I agree with those who argue that educational software needs to take advantage of better graphics and sound tools. If you look at the history of educational software, you may conclude that software developers have not (with few exceptions) fully used the tools at their disposal. Few

pieces of educational software exploit those capabilities that distinguish computers from books.

Yes, many new programs do show a willingness to accept the computer as a medium in its own right, but these programs have arrived nearly ten years after the introduction of personal computers.

The challenges facing creators of educational software are challenges of the spirit, not of technology. I doubt that the simple introduction of a new computer into the marketplace can make the quality of educational software take a giant leap forward.

Opening the Toolbox

In addition to new graphics and sound capabilities, the Apple IIGs includes a set of toolbox routines with which software developers can create software with some of the look and feel of Macintosh programs. This toolbox may be the most significant distinguishing feature of the Apple IIGs.

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DEALER INQUIRIES INVITED

Although some computer users feel that command-line interpreters are preferable to visual displays of "desktops" and that typing RUN PROGRAMNAME is better than double-clicking a mouse on an icon, the visual user interface is steadily gaining converts and is convincing people that you don't have to know anything about computing to use a computer.

The education market is one where this feature is probably more important than anywhere else. Teachers do not have the time to wade through massive manuals just to learn how to load a program. Have you ever seen a second-grade teacher tell a student who is using a Commodore 64 to type LOAD "***,8,1? It is not a pretty sight.

By creating a uniform and highly visual user interface—and by providing toolbox routines to encourage developers to write software that uses this interface—the Apple IIGS promises to allow the creation of educational programs that are easy to learn and easy to use. Most important, as with most Macintosh programs, users will find that commands that behave in a certain way for one program will behave the same way for another. The benefit of a well-designed user interface is that it gets out of the users' way, and this unobtrusiveness is part of the promise of the Apple IIGS. I believe the Apple IIGS (in the hands of the right programmers) will be a showcase for some excellent educational software.

And Now for Question 2

All of which brings me to the second question: Should schools rush to upgrade their old Apple IIe computers to the Apple IIGS?

My guess is that, over the long term, Apple will phase the Apple IIe out of production as soon as demand falls and that the Apple IIGS will become its logical successor. The IIGS's ability to use existing peripheral cards and equipment is essential to this transition.

To show just how compatible the IIGS really is, I connected a 1979 Apple II disk drive (with a new connector) to the disk-drive port of the Apple IIGS, and it worked perfectly. Such attention to compatibility is unprecedented in the personal-computer industry.

Still, it might be wise to wait a bit before rushing to purchase the upgrade. For one thing, there isn't

much software that requires the IIGS yet, although this situation is sure to change soon.

Cloning Around

Second, you can spend the money elsewhere. Even with special institutional discounts, upgrading the IIe to the IIGS is going to cost several hundred dollars.

A few months ago, a friend dropped by to show me a Laser 128 with a built-in disk drive and all the printer and communication ports you could ask for. He'd paid about \$370 or so for this Apple II-compatible

The point here is that no one should upgrade a computer for its own sake.

ble computer. Spend another \$70 for a monochrome monitor, and you'd have a complete computer system for close to the price of the IIGS motherboard alone. Never mind new disk drives, mice, and other devices you need to take full advantage of the GS.

Most schools are trying to reduce the student/computer ratio. For people in this situation, the purchase of another computer may make much more sense than spending money on an upgrade at this time.

What Are We About?

The point here is that no one should upgrade a computer for its own sake. The whole reason we have computers in the classroom is to help our students. As we make purchase decisions regarding software and hardware, our overriding concern should be to ensure that the students' needs are served. For some of us, working toward this goal requires that we get more computers, and for others it means that we should make our existing computers more powerful.

Should you upgrade your Apple IIe computers to the Apple IIGS? Think about your real needs—the answer will be obvious. †

David Thornburg is a consulting editor of A+ and is actively engaged in the design and creation of computer-based tools that foster the development of creativity in their users. He can be reached in care of this magazine.